twin being absent, and five units being held in common.) However, such a model casts shadows that are in poorer agreement with the virus pictures than does the icosahedron. It would seem necessary to conclude that the subunits are either much larger in number than 12 or are shaped properly to contribute to the icosahedral appearance. Caspar's x-ray data on bushy stunt virus suggest that the most likely number of subunits is 60. His results would be consistent with the electron micrographs if, for example, each of the icosahedral vertices consisted of a cluster of five subunits.

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Histochemical Evidence of Protein-Bound SH Groups in Plant Tissues with 4-Iodoacetamido-1-naphthol

Dickens (*1*) and Rapkine (*2*) studied inhibition of glycolysis by iodoacetate and iodoacetamide and reported that inhibition was a result of an alkylation reaction with sulfhydryl (SH) groups of reduced glutathione. Young and Conn (*3*) obtained almost complete inhibition of wheat-germ glutathione reductase with iodoacetic acid ($10^{-2}M$) and iodoacetamide ($10^{-3}M$). Barrnett and Seligman (*4*) found complete inhibition of SH staining with 2,2′-dihydroxy-6,6′-dinaphthyl disulfide (DDD) in tissues pretreated with iodoacetate ($0.1M$). However, Barron (*5*) stated that iodoacetate is not SH specific and will react with amino groups of amino acids at a physiological *p*H. Barrnett, Tsou, and Seligman (*6*) reported the results of preliminary histochemical experiments with 4-iodoacetamido-1-naphthol (IAN).

Experiments were conducted with IAN to determine the SH specificity of this reagent in a diazo-coupled reaction in plant tissues. *Zea mays* L. embryos were excised in early stages of germination, when the coleorhiza had initially split the pericarp of the grain. The specimens were fixed for 24 hours in a 2-percent solution of trichloroacetic acid in 80-percent ethyl alcohol. The specimens were dehydrated, imbedded in paraffin, and sectioned at 15 μ. The sections, mounted on slides with albumin, were stained by a modification of the diazo-coupling method of Barrnett and Seligman (*4*) for DDD. In this method, the slides were incubated 2 hours at 60°C in a mixture consisting of 35 ml of Michaelis barbital buffer (*p*H 8.55) plus 15 ml of absolute ethyl alcohol containing 35 mg of 4-iodoacetamido-1-naphthol (*7*). In the coupling reaction the slides were stained in 3 to 5 minutes with tetrazotized diorthoanisidine. Inhibition was achieved by pretreatment of controls for 24 hours in an aqueous solution of N-ethyl maleimide ($0.1M$).

The highest concentration of protein-bound SH was observed in the promeristem of the radicle, and the staining diminished rapidly back from the apex. A high concentration was also observed in the promeristems of the paired adventitious roots located above the level of the scutellar node. Moderate-to-strong staining was observed in the procambial strands throughout the embryo. The embryonic vascular bundles of the epicotyl and coleoptile are similarly stained in cross section. Although the entire embryo is diffusely stained, those areas indicating the least SH include scutellum, coleorhiza, coleoptile, and scutellar node.

The results obtained with IAN are in complete agreement with results that I reported previously (*8*) for TCA-pretreated specimens stained with nitroprusside reagent and Bennett RSR reagent, respectively. Furthermore, I have obtained an identical staining pattern for these tissues with DDD (*9*). We can therefore conclude that the results obtained with this new SH reagent are valid, inasmuch as these findings correspond with results obtained by different types of histochemical reactions (mercaptan, disulfide, and alkylation reactions).

There is, however, the possibility that this reagent may couple with amino groups. Danielli (*10*) has suggested the use of a specific and readily removable NH_2-blocking agent to achieve SH specificity. The Danielli dinitrofluorobenzene method for tyrosine, SH, and NH_2 is based on a series of specific blocking agents. This line of approach has not, in general, been successful (*11*), and I have not used any NH_2-blocking agents with IAN.

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Odostomia impressa Parasitizing Southern Oysters

Recently Loosanoff (*1*) has reported observations on the pyramidellid snail *Odostomia* (*Menestho*) *bisuturalis* Say as an "obscure oyster enemy" in New England waters. According to Abbott (*2*) and Miner (*3*), *O. bisuturalis* has its southern limit at Delaware Bay. It should now be recorded that *Odostomia* (*Menestho*) *impressa* Say, which ranges from Massachusetts Bay to the Gulf of Mexico, has similar habits. A hundred or more of these snails may be found holding to the extreme margins of an oyster's shell, each inserting its proboscis between the valves whenever the oyster opens to feed. G. Robert Lunz, director of the Bears Bluff Laboratories, demonstrated this to P. Korringa of Holland and myself when we visited South Carolina in 1948. On the very day that Loosanoff's article appeared in *Science*, I arrived at Bears Bluff to begin a long-planned study of this interesting parasite.

Observations and experiments on *Odostomia impressa* to date indicate that its behavior differs somewhat from that of *O. bisuturalis* as described by Loosanoff. Rather than attacking young oysters, like the northern species, *O. impressa* works mostly on large oysters. When numerous snails are placed in the middle of aquaria containing adult oysters at one end and shells covered with spat (3 to 19 mm long) at the other end, the majority of the snails go to the large oysters, and this majority gradually increases as snails desert the spat and collect on the large oysters. Snails placed in an aquarium with single oysters of graded sizes, 26 to 76 mm long, assemble in the largest numbers on the largest oysters and in proportionately smaller numbers on the smaller oysters. Rough surfaces, such as the outside surfaces of oyster shells, attract or retain more snails than smooth surfaces, such as the inside surfaces of oyster shells. Shells of living oysters, bearing many attached snails, lose these snails when the oyster is carefully opened